UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/957,409	09/20/2001	Mooi Choo Chuah	Chuah 56-1-3-3	4509

7590 05/17/2005

Docket Administrator (Room 3J-219)
Lucent Technologies Inc.
101 Crawfords Corner Road
Holmdel, NJ 07733-3030

EXAMINER	
SHAH, CHIRAG G	

ART UNIT	PAPER NUMBER
2664	

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/957,409	CHUAH ET AL.	
	Examiner	Art Unit	
	Chirag G. Shah	2664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 September 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2 sheets*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim1 objected to because of the following informalities: In claim 1, line 11, "the multiplexed" is repeated back to back. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 1 rejected under 35 U.S.C. 102(e) as being anticipated by Tang et al. (U.S. Pub. No. 2001/0025321), hereinafter referred as Tang.

Regarding claim 1, Tang discloses in fig. 2 of a protocol stack comprising:

an Internet protocol layer **[fig. 2, IP layer 208]** for adding Internet protocol overhead information to data packets to produce Internet protocol data packets **[as disclosed in paragraph 0019 and fig. 3, an IP data packet includes an IP header 306 containing information for the IP protocol and data];**

a multiplexing layer for adding multiplexer overhead information to the Internet protocol data packets **[as disclosed in fig. 4 and paragraph 0023, multiple cIP packets are each added with a Length Indicator (LI) 404-fig. 4]** and

multiplexing the Internet protocol data packets and multiplexer overhead information to produce a multiplexed data packet **[as disclosed in fig. 4 and 5, each IP packet having address label/Data** (each address label retaining compressed IP header, see 0024) **and LI are multiplexed to produce a multiplexed data packet frame],**

wherein the multiplexer overhead information **[LI 404-fig. 4 and LI 506-fig. 5]** are interposed between the internet protocol data packets **[address label-510/Data-512, fig. 5]** associated with the Internet protocol data packets **[as disclosed in fig. 5, an LI representing a multiplexer overhead information is interposed between address label/Data associated with each IP data packets]**; and

a multi protocol label switching layer **[fig. 2, MPLS layer 206]** for adding multi protocol label switching overhead information to the multiplexed data packet to produce a multi protocol label switching data packet **[as disclosed in paragraph 0026 and 0038, lines 23-33 and as illustrated in fig. 5, the frame relay frame 500 adds an a PPP header and preferably an MPLS header, to the multiplexed data packets to produce an MPLS Packet frame]** as claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 2 rejected under 35 U.S.C. 103(a) as being unpatentable over Tang et al. (U.S. Pub. No. 2001/0025321), hereinafter referred as Tang in view of Applicant Admitted Art (Page 1 of Specification).

Regarding claim 2, Tang discloses in fig. 2 of Layer 1 202, Layer 2 204 and MPLS. Tang further discloses in paragraph 0026, that Frame Relay 500 includes an MPLS header that includes PPP header 502. *Tang explicitly fails to explicitly disclose that each layer, PPP/HDLC layer add overhead information to the MPLS packet.*

Applicant discloses in page 1, lines 22-24 of the specification that PPP/HDLC overhead information is added by the PPP/HDLC layer to the MPLS data packet and encapsulated in a PPP/HDLC frame to produce a PPP/HDLC data packet. Applicant discloses that the protocol stack 10 of fig. 1 is well known in the art. Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention modify Tang's invention to explicitly disclose that each layer PPP and HDLC adds respective overhead information to the MPLS packet as taught by Applicant Admitted Art (Page 1 of Specification). One is motivated as such in order to process data packet going down a protocol stack.

6. Claims 3-7 and 9-15 rejected under 35 U.S.C. 103(a) as being unpatentable over Tang et al. (U.S. Pub. No. 2001/0025321), hereinafter referred as Tang in view of Subbiah (WO 00/11849).

Regarding claim 3, Tang discloses in **figs. 4 and 5** of a method for multiplexing streams of Internet protocol (IP) data packets comprising the steps of:

multiplexing within a frame a first overhead information **[LI (Length Indicator) 404, fig. 4]** and a first IP data packet **[cIP 408, fig. 4],** the first overhead information indicative of a length associated with the first IP data packet **[as disclosed in paragraph 0023, lines 7-8 and 0027, lines 1-3, multiple MPLS packets each comprise a packet length indicator associated with the respective IP data packet].** Tang further discloses in fig. 5 of multiplexing a plurality of IP packets having headers into a packet frame.

Tang fails to explicitly disclose the steps:

determining whether a second data packet can be multiplexed into the same frame with the multiplexed first IP overhead information and the first IP data packet; and

multiplexing within the frame the second IP overhead information and the second IP data packet if the second IP data packet can be multiplexed into the frame.

Subbiah teaches on page 4, lines 35-36 of a flexible mechanism employing timers to facilitate efficient multiplexing. Subbiah discloses on **page 8, lines 15-26 and in fig. 3**, the multiplexing control unit (CU) 350 moves voices samples from the voice stream buffers 330-334 to the packetization buffer 360. The CU 350 prepends a suitable header to the voice samples prior to storing it in the packetization buffer 360. Based on the value of the time Tp 370 and on the occupancy of the packetization buffer 360, data from the packetization buffer is sent out into the network after suitably prepending it with the necessary header. **This establishes that the multiplexing CU determines whether a second/additional data packet can be multiplexed into the same frame as the previous IP data packet based on the timer value and on the occupancy of the**

buffer. If it is determined that the timer has not expired or the occupancy has not been met, a second/additional packets will continue to be accepted, once the timer expires, the multiplexed data frame (having first, second and/or additional packets in packetization buffer 360 as shown in fig. 3) will be sent out into the network attached with necessary header.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Tang to include a determination step of whether an additional/second IP data packet can be multiplexed into the frame as taught by Subbiah. One is motivated as such in order to provide for bandwidth efficiency by reducing overhead per packet, while satisfying the delay bound for packet stream *(Subbiah, Page 4, lines 16-23).*

Regarding claim 4, Tang discloses in fig. 4 and 5 of multiplexing multiple data packets into a single frame. *Tang fails to disclose wherein the second IP overhead information and the second IP data packet can be multiplexed within the frame if the multiplexed first IP overhead information and the first IP data packet are not greater than a target size.*

Subbiah discloses on **page 5, lines 3-8** that the extraction of data from the buffers is triggered when either the time expires or when the accumulated data reaches a certain size. Subbiah further discloses **on page 8, lines 18-26**, based on the value of the timer 370 and on the occupancy of the packetization buffer, data from the packetization buffer is sent out into the network after suitably prepending the it (multiplexed data) with the necessary headers. This clearly establishes that second/additional IP packets can be

multiplexed within the packetization buffer frame if the previous/first IP packet did not cause the buffer occupancy to exceed the predefined target size.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Tang to include having a target size threshold for multiplexing additional/second IP data packet as taught by Subbiah. One is motivated as such in order to provide for bandwidth efficiency by reducing overhead per packet, while satisfying the delay bound for packet stream *(Subbiah, Page 4, lines 16-23)*.

Regarding claim 5, Tang discloses in figs. 4 and 5 of a method for multiplexing streams of Internet protocol (IP) data packets. *Tang fails to disclose wherein the target size is 300 bytes.*

Subbiah discloses on page 10, lines 6-12, that the data from the packetization buffer 360 is transmitted onto the network when the amount of data in the packetization buffer 360 just exceeds the maximum packet payload size. The maximum packet payload size is governed by the MTU (maximum transmission unit) within the network. The clearly suggests that MTU may variable based on the network type. This is usually 1500 bytes for IP datagrams over the public Internet. However, since maximum payload size is variable based on the network type, this clearly implies that a maximum target size of 300 bytes may be governed by the MTU within an alternate network type.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to apply the teachings of the maximum packet payload size being governed by the maximum transmission unit within the network, which may vary based

on network type as taught by Subbiah into Tang's invention. One is motivated as such in order to provide for bandwidth efficiency by reducing overhead per packet, while satisfying the delay bound for packet stream *(Subbiah, Page 4, lines 16-23).*

Regarding claim 6, Tang discloses in figs. 4 and 5 of a method for multiplexing streams of Internet protocol (IP) data packets. *Tang fails to disclose wherein the target size is based on desired jitter performance.*

Subbiah discloses that in col. 10, lines 6-12 that the target maximum payload size is governed by the MTU within the network, which varies from network to network. Subbiah discloses on **page 5, lines 3-8** of setting a target size, when the accumulated data reaches a certain size or when the timer expires. Subbiah in the respective section discloses that the network operator may set the target based on either a known approximation of end-to-end delay or the multiplexing controller having the capability to extract the network delay information form the RTCP (Real Time Control Protocol provides a receiver generated reports as periodic intervals that include network delay in the forward direction for a packet stream) reports. Since jitter by definition is the variation in the time between arriving packets. The target is set based the RTCP generated reports providing information on network delay for the packet streams.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Tang to include the setting a target based on jitter information generated by the RTCP as taught by Subbiah. One is motivated as

such in order to set target based on the network delay observed during multiplexing process ensuring efficient flexible multiplexing *(Subbiah, page 4, lines 24-32).*

Regarding claim 7, Tang discloses in paragraph 0029 that when an oversized packet is transmitted, such packets must be fragmented and a transmitting communications device must add a sequence number. Tang discloses in **figs. 4** of an example wherein the second IP overhead information and the second IP data packet **[2nd 404-410 in fig. 4]** can be multiplexed within the frame **[400, fig. 4]** if the first IP data packet **[1st 404-410 in fig. 4]** was not an oversized IP data packet **[Note: first IP data packet is not oversized since a sequence number is not included]** as claim.

Regarding claim 9, Tang discloses in figs. 4 and 5 of a method for multiplexing streams of Internet protocol (IP) data packets. *Tang fails to disclose wherein the second IP overhead information and the second IP data packet can be multiplexed within the frame if a timer has not expired.*

Subbiah discloses on **page 5, lines 3-8** that the extraction of data from the buffers is triggered when either the time expires or when the accumulated data reaches a certain size. Subbiah further discloses **on page 8, lines 18-26**, based on the value of the timer 370 and on the occupancy of the packetization buffer, data from the packetization buffer is sent out into the network after suitably prepending the it (multiplexed data) with the necessary headers. This clearly establishes that second/additional IP packets can be multiplexed within the packetization buffer frame if a timer has not expired the set value.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Tang to include having a timer set value for multiplexing additional/second IP data packet as taught by Subbiah. One is motivated as such in order to provide for bandwidth efficiency by reducing overhead per packet, while satisfying the delay bound for packet stream *(Subbiah, Page 4, lines 16-23).*

Regarding claim 10, Tang discloses in figs. 4 and 5 of a method for multiplexing streams of Internet protocol (IP) data packets. *Tang fails to disclose wherein the time is set to expire based on desired delay sensitivity.*

Subbiah discloses on **page 5, lines 3-8** of how the time set to expire is based on desired and reported network delay information. Subbiah discloses **on page 5, lines 3-8** that the network operator may set the timer target based on either a known approximation of end-to-end delay or the multiplexing controller having the capability to extract the network delay information form the RTCP (Real Time Control Protocol provides a receiver generated reports as periodic intervals that include network delay in the forward direction for a packet stream) reports. This clearly establishes that the time target value is set to expire based the RTCP generated reports providing information on network delay for the packet streams, which assure the best possible desired delay sensitivity.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Tang to include the setting a timer to expire based on the best possible desired delay sensitivity generated by the RTCP as taught by Subbiah. One is motivated as such in order to set timer expiry based on the

network delay observed during multiplexing process ensuring efficient flexible multiplexing *(Subbiah, page 4, lines 24-32).*

Regarding claim 11, Tang discloses in paragraph 0029 that when an oversized packet is transmitted, such packets must be fragmented and a transmitting communications device must add a sequence number. Tang discloses in **figs. 4** of an example wherein the second IP overhead information and the second IP data packet **[2nd 404-410 in fig. 4]** can be multiplexed within the frame **[400, fig. 4]** if the first IP data packet **[1st 404-410 in fig. 4]** was not an oversized IP data packet **[Note: first IP data packet is not oversized since a sequence number is not included]** Tang discloses in figs. 4 and 5 of a method for multiplexing streams of Internet protocol (IP) data packets. *Tang fails to disclose wherein the second IP overhead information and the second IP data packet can be multiplexed within the frame if a timer has not expired or the multiplexed first IP overhead information and the first IP data packet are not greater than a target size.*

Subbiah discloses **on page 8, lines 18-26**, based on the value of the timer 370 and on the occupancy of the packetization buffer, data from the packetization buffer is sent out into the network after suitably prepending it (multiplexed data) with the necessary headers. This clearly establishes that second/additional IP packets can be multiplexed within the packetization buffer frame if a timer has not expired the set value or if the occupancy of the packetization buffer frame is not full.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Tang to include having a timer set value or target occupancy of buffer frame for multiplexing additional/second IP data packet as

taught by Subbiah. One is motivated as such in order to provide for bandwidth efficiency by reducing overhead per packet, while satisfying the delay bound for packet stream *(Subbiah, Page 4, lines 16-23).*

Regarding claim 12, Tang discloses in **paragraph 0024, lines 9-15**, wherein the first IP overhead information is one byte **[as disclosed in col. 0024, lines 9-15, the compressed IP header in each multiplexed MPLS packet may be replaced by an address label that is one to two bytes in length]** as claim.

Regarding claim 13, Tang discloses in **paragraph 0023, lines 5-14** wherein the first IP overhead (first of multiple packets shown in fig. 4) information utilizes an octet [1 Byte] to indicate the length associated with the first IP data packet as claim.

Regarding claim 14, Tang discloses in fig. 7, block 702 of receiving multiple data packets to produce multiple received data packets, each including routing address. *Tang, however, explicitly fails to disclose wherein the first IP data packet and the second IP data packet belong to different IP data streams.*

Subbiah, discloses **in fig. 3 and on page 7, lines 28-37**, each voice stream 310, 312, 314 are associated with buffer 330, 332, and 334. The buffers 330, 332, 334 provide packets to the CU 350 and the multiplexing CU 350 then packetizes the voice streams 310, 312, and 314 at a packetization buffer. Thus, clearly establishing that each IP data packet that is multiplexed into one frame can belong to different IP data streams.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Tang to explicitly include that each of the multiplexed packet belong to different IP data streams as taught by Subbiah. One is motivated as such in order to advantageously multiplex several voice calls traversing the same pair of telephone gateway ensuring a improvement of the bandwidth efficiency by reducing overhead per packet *(Subbiah, page 4, lines 14-17)*.

Regarding claim 15, Tang discloses in **fig. 7, paragraphs 0031 and 0038** comprising the additional step of:

Tang discloses in **fig. 7, block 705** of adding multi protocol label switching overhead information to overhead information and data packets multiplexed within the frame when no more IP data packets can be multiplexed within the frame **[as disclosed in fig. 7, upon adding the labels to the data packet, step 705, no additional packets are being accepted for multiplexing since after adding the labels, the step 706 of multiplexing the multiple data packets into a frame takes place, followed by step 707 of adding a data transmission header to the multiplexed data packets and step 708 of forwarding the frame takes place].**

7. Claim 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Tang in view of Subbiah as applied to claims 3-7 above, and further in view of Yeung et al. (U.S. Patent No. 6,061,365), hereinafter referred as Yeung.

Regarding claim 8, Tang discloses in paragraph 0029 that over sized with packet must be fragmented and a transmitting device adds a sequence number into the frame to indicate the fragmentation. Tang further discloses in fig. 6 of a first fragmented packet having IP overhead information with a sequence number. *Tang in view of Subbiah explicitly fails to disclose wherein the first IP overhead information is all zeroes if the first IP data packet is an oversized data packet.*

Yeung discloses in col. 15, lines 65 to col. 16, lines 10 that a message sequence is set to zero for each new message sent and is incremented for each 256-byte fragment. This, clearly establishes that a fragmented packet are sent with a sequence number beginning with zero.

Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Tang in view of Subbiah to include transmitting a fragmented packet beginning with a sequence number of zero as taught by Yeung. One is motivated as such in order to reconstruct the message from the first packet to the last *(Yeung, col. 16, lines 5-10).*

8. Claim 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Tang in view of Subbiah (WO/00/41527) as applied to claims 3-7 and 9-15 above, and further in view of Subbiah et al. (U.S. Patent No. 6,366,961).

Regarding claim 16, Tang in view of Subbiah disclose of multiplexing streams of IP data packets. Tang in view of Subbiah fails to disclose the additional step of: demultiplexing the first IP data packet from the frame using the first IP overhead information. Subbiah et al. (U.S Patent

No. 6,366,961) discloses in the **abstract, lines 9-20, and fig. 6 (step 620,630)** the step of demultiplexing the mini packets associated and analyzing the header of each mini packet to determine identifying mini packets destined for a local user. Each minipacket include IP header including destination transferring information. Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the teachings of Tang in view of Subbiah to include the step of demultiplexing the data packet using IP overhead information as taught by Subbiah et al (U.S. Patent No. 6,366,961). One is motivated as such in order to transfer the packets to the appropriate destinations by identifying a user and a connection associated therewith *(Subbiah et al. (U.S. Patent No. 6,366,961, col. 3, lines 33-40).*

Conclusion

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Or faxed to:

(703)305-3988, (for formal communications intended for entry)

Or:

(703)305-3988 (for informal or draft communications, please label "Proposed" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chirag G. Shah whose telephone number is 571-272-3144. The examiner can normally be reached on M-F 6:45 to 4:15, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cgs
May 16, 2005

Chirag Shah